

**MERCURY INVESTIGATION
SOIL AND SEDIMENT SAMPLING
RESULTS**

**FAA William J. Hughes Technical Center
Atlantic City International Airport, New Jersey**

April 1998

Prepared for
**Federal Aviation Administration
William J. Hughes Technical Center
Atlantic City International Airport, New Jersey**

Prepared by
**TRC Environmental Corporation
Windsor, Connecticut**

**TRC Project Nos. 01040-0020-00134
01040-0030-00104**

May, 1998

**TRC Environmental Corporation
5 Waterside Crossing
Windsor, Connecticut 06095
Telephone 860-289-8631
Facsimile 860-298-6339**

May 15, 1998

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
Building 270, Room A101
Atlantic City International Airport, NJ 08405

RE: Mercury Investigation
TRC Project Numbers: 01040-0020-00134
01040-0030-00104

Dear Mr. Buch:

TRC Environmental Corporation (TRC) is pleased to present the field observations and analytical results of the mercury investigation and sampling activities conducted in April 1998 at the FAA William J. Hughes Technical Center (Technical Center). Samples were collected at the following locations: Area B, the drainage swale to the west of Tilton Road, a select location adjacent to the South Branch of Absecon Creek (South Branch), the Building 270 outfall drainage swale, and four associated stormwater catch basins within the Air National Guard Built-up area.

This letter report presents a discussion of background information, a description of field activities, a summary of laboratory analyses of the collected samples, a discussion of the analytical results and recommendations for further actions, as appropriate.

BACKGROUND

In response to mercury and other contaminant concerns identified at the Technical Center during previous studies and investigations, the United States Fish and Wildlife Service (USFWS) conducted a facility-wide ecological risk assessment (ERA) in 1996. A report entitled *Environmental Contaminants Impact Analysis and Ecological Risk Assessment for the Federal Aviation Administration Technical Center CERCLA Sites in Atlantic County, New Jersey* was submitted by USFWS in April 1996. Of relevance to TRC's current investigation of potential source areas for mercury are the findings outlined in the USFWS report regarding the concentrations found in the sediments of the South Branch near Area B. The USFWS stream sampling location identified in the report as station 6, yielded a concentration of mercury in the sediments of 67.9 parts per million (ppm). The location of station 6 corresponds to the region of the South Branch downstream of the former sewage treatment plant and Area B.

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 2

As a result of the findings of the ERA, further investigation was undertaken by the USFWS targeting the sediments in the South Branch and its former meanders. The results of this study were submitted in a March 1998 report entitled *Mercury in Sediments, Soils, and Surface Water of the Federal Aviation Administration William J. Hughes Technical Center, Atlantic County, New Jersey*. The approach taken by the USFWS was to collect numerous sediment samples from the South Branch and its former meanders. Samples were collected from the Upper Atlantic City Reservoir to approximately 3,500 feet upstream of where Tilton Road crosses the South Branch. Sediment samples were also collected from select locations along the North Branch and several of its tributaries north of Runway 13-31. Furthermore, the USFWS collected a number of soil samples from suspected mercury source areas, including the area surrounding the former sewage treatment plant and the former incinerator ash pile (Area I). Sampling protocol included collecting sediments from the 0 to 6 inch and 12 to 24 inch depth intervals. Soil samples were collected from depth intervals of 0 to 1 feet and 3 to 4 feet. The results of the investigation confirmed the presence of "hot spot" mercury contamination in the South Branch sediments near Area B. Typically, the most elevated mercury concentrations occurred in the surface sediments of the South Branch channel as opposed to the subsurface sediments. The results from the former meanders of the South Branch indicated that there was little variation in the concentrations between the surface and subsurface sediments. USFWS results also indicated that there was no mercury detected above laboratory quantitation limits in the Building 270 drainage swale. Finally, the USFWS study results indicated that the highest level of mercury detected in the soils, 10 ppm, was found in a sample collected adjacent to the former sewage treatment plant. However, this was an isolated "hit" with a majority of the samples collected in this area below laboratory quantitation limits. Therefore, this single result was not considered to be representative of a source of the mercury contamination detected within the South Branch.

A comparison of the mercury levels encountered in the sediment during the USFWS studies to the background levels of mercury for the Pinelands National Reserve confirm that there are elevated levels of mercury found in association with the South Branch and its former meanders.

SCOPE OF WORK

The scope of work outlined for TRC's mercury investigation was based on the results of the USFWS draft report submitted in March 1998 and on discussions held between TRC and FAA personnel. The sample locations for TRC's investigation are included in Figures 1 through 3.

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 3

Field Activities

Between April 1 - 2, 1998, TRC conducted a mercury investigation at five targeted areas, as previously mentioned. The main objective of the investigation was to collect soil and sediment samples in order to identify potential source areas of mercury contamination that was identified by the USFWS in the sediments of the South Branch and its former meanders. A total of 21 locations were sampled, with soil samples collected from 10 of the locations and sediment samples collected from 11 locations. With the exception of 4 sampling locations (the stormwater catch basins in the Air National Guard area), 2 samples were collected from each location: one from a depth interval of 0 to 12 inches below the ground surface, and one from a depth interval of 12 to 24 inches below the ground surface. Sample summary data, including location coordinates, sample matrix, sample depth, and analyses, are included in Table 1.

A 2¼-inch diameter stainless steel bucket auger was used to collect both the soil and sediment samples from each location, except for the stormwater catch basin locations. A dedicated, decontaminated bucket auger attached to a T-handled extension rod was used for each sample interval at each sample location.

Soil Samples - Once the soil sampling locations were established, each location was cleared of any overlying organic material (e.g., pine needles, leaves, etc.) that would potentially bias the total organic carbon results. Subsequent to that, a bucket auger was advanced to a depth of 12 inches below the ground surface, as measured with an engineer's ruler. All of the soil removed from the 0 to 12 inch interval was placed into a decontaminated stainless steel bowl. A stainless steel spoon was then used to completely homogenize the soil sample by mixing prior to placing the sample in the appropriate sample container. This process was repeated with a decontaminated bucket auger in order to collect a sample from the 12 to 24 inch sampling interval.

Sediment Samples - Sediment samples from the drainage swales were collected in a similar manner to that described above, with one modification. A decontaminated, four-inch diameter PVC pipe measuring three feet in length was driven into the sediment to a depth of one foot, as indicated relative to the depth of the water at any given sampling location. This allowed for the collection of sediment samples with minimal collapse of the borehole, as the influx of water was impeded by the PVC pipe. The samples from both depth intervals were collected and handled as designated above. The overall approach for the collection of the sediment samples in the drainage swales involved sampling successively from the downstream to the upstream locations. This eliminated the potential for the sample integrity to be compromised by disturbing sediments upstream prior to sampling downstream locations.

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 4

Sediment samples from three of the four stormwater catch basins were collected using a decontaminated stainless steel test pit sampler. The decontaminated scoop portion of the sampler was lowered into the bottom of each catch basin by an extended handle. The scoop was then dragged across the bottom of the catch basin, collecting sediment as it was dragged. The resulting sample was then placed into a stainless steel bowl for homogenization and handling as described above. One catch basin sediment sample, CB-2, was collected using a stainless steel spoon, as the catch basin was very shallow.

All samples were placed in EPA-certified clean, clear glass bottles, sealed, labeled, and transported under chain-of-custody procedures in chilled sample coolers to the laboratory (RECRA Labnet, Philadelphia) after each day's sampling was completed. Prior to the collection of each sample interval and between sampling locations, the bucket augers and other equipment not dedicated to each sample were properly decontaminated to ensure sample integrity.

Both field and laboratory quality assurance/quality control (QA/QC) samples were collected during the course of the mercury investigation. Field QA/QC samples included an equipment rinsate blank (field blank) which was collected using laboratory-supplied water. The field blanks were obtained by pouring the supplied water over and through decontaminated sampling equipment (i.e., stainless steel bowl, spoon, bucket auger, and PVC pipe where applicable). One field blank to be analyzed for total mercury was collected prior to commencing field activities each day. Laboratory QA/QC samples included blind duplicates (at a rate of 1 for every 20 samples analyzed) and matrix spike/matrix spike duplicates.

The soil and sediment samples including blind duplicates were analyzed in accordance with Contract Laboratory Program (CLP) protocol for total mercury (by cold vapor atomic adsorption) and total organic carbon. One field blank (FB-040198) was analyzed for total mercury and TOC, while the other field blank (FB-040298) was analyzed for mercury only.

Subsequent to sampling, the locations were marked in the field with pin flags and flagging tape. After the completion of the field work, the horizontal positions of the sampling points were measured using a hand-held Global Positioning System (GPS) instrument. The calculated New Jersey plane coordinates of the sample locations are included in Table 1.

FIELD INVESTIGATION OBSERVATIONS / ANALYTICAL RESULTS

Soil and sediment samples were collected and analyzed as follows: nine surface soil locations from Area B; six sediment locations from the drainage swale west of Tilton Road; one surface

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 5

soil location from the north bank of the South Branch; four sediment samples from stormwater catch basins in the Air National Guard Built-up area; and one sediment location from the Building 270 outfall drainage swale. This sampling plan was altered slightly from the original proposal for the work based on discussions between TRC and FAA personnel. Namely, soil samples were not collected from the dirt service road to the east of the drainage swale (west of Tilton Road) in light of updated information from FAA personnel. Information originally conveyed to TRC personnel indicated that dredged spoils from the South Branch were used to regrade the dirt service road. Updated information obtained just prior to the commencement of field activities indicated that the spoils, potentially impacted by mercury contamination, were simply pushed up onto the banks of the South Branch. This claim was deemed to be consistent with topographic mounds observed immediately adjacent to the banks of the South Branch. The remainder of the sampling program remained consistent with that outlined in the original proposal, and served to supplement the sampling completed by the USFWS.

No visual or odorous indications of contamination were observed in any of the samples collected. In general, the soil collected at Area B and the sediment from the Building 270 outfall drainage swale were characterized by fine to medium sands with little fine to medium gravel and trace silt, with varying amounts of organic matter and moisture (depending upon the location and the discrete interval being sampled). The samples from the drainage swale to the west of Tilton Road were characterized in general by fine to coarse sands with little gravel and little silt. One exception to this characterization were the samples identified as DSWTR-4A (6"-12") and -4B (12"-24"). These samples were characterized by yellowish orange clay and silt that was very cohesive. The sample collected on the north bank of the South Branch was characterized by a dark grey fine sand and silt, representing a well developed soil horizon. The catch basin samples were characterized in general by fine to coarse sands with varying amounts of gravel.

A summary of the soil and sediment samples collected during the mercury investigation is provided in Table 1. Analytical results of the samples are summarized in Table 2. Full analytical data, including QA/QC information, are included as Attachment A. A discussion of the analytical results follows.

Surface Soil - Area B

Analytical results for four out of the nine sampling locations at Area B indicated the presence of mercury. The upper discrete interval of both samples collected from the old road bed adjacent to the north bank of the South Branch, B-SS1A and B-SS2A, tested positive for mercury at concentrations of 0.06 and 0.18 parts per million (ppm), respectively. Additionally,

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 6

both discrete sampling intervals at sampling locations B-SS3 and B-SS4, to the north of the old road bed in the wooded area adjacent to Area B, yielded positive results for mercury. The concentrations of mercury reported for samples B-SS3A and -B were 7.8 ppm and 0.98 ppm, respectively. The concentrations of mercury reported for samples B-SS4A and -B were 1.2 ppm and 2.2 ppm, respectively. A blind duplicate sample of B-SS4B was submitted for analysis and identified as B-10SSA. The concentration of mercury reported by the laboratory for the duplicate was 2.6 ppm, a concentration that falls within 20 percent of that reported for B-SS4B, indicating good analytical reproducibility. Mercury was not detected above the laboratory detection limits (0.05 - 0.06 ppm) in any of the other samples submitted from this area.

Total organic carbon (TOC) results of the Area B soils ranged from 653 ppm to 70,800 ppm. Generally, the TOC concentrations were higher in the wooded area (B-SS1 through B-SS4) than the open grassy field (B-SS5 through B-SS9). Furthermore, the TOC concentrations of the lower sample interval (1 - 2') in the wooded area were slightly more elevated than the upper interval; conversely, TOC in the upper interval was higher than the lower interval in the soil samples from the open grassy area.

Sediment - Drainage Swale West of Tilton Road and Soil - North Bank of South Branch

Mercury was not detected above the laboratory detection limits in any of the samples collected from the drainage swale to the west of Tilton Road. The blind duplicate of sample DSWTR-3A, identified as DSWTR-7A, also yielded a non-detect (less than 0.06 ppm) result. TOC results of the drainage swale sediments ranged from 126 ppm to 7,630 ppm.

The soil samples collected from the north bank of the South Branch also did not exhibit mercury above laboratory detection limits (0.05 - 0.06 ppm). TOC results of the two samples from SBNB-1 indicated 13,300 ppm in the shallow sample and 25,100 ppm in the deeper sample.

Sediment - Stormwater Catch Basins in Air National Guard Area

Mercury was not detected above the laboratory detection limits (0.05 - 0.06 ppm) in any of the samples collected from the stormwater catch basins in the Air National Guard Built-up area. TOC results ranged from 760 ppm to 10,300 ppm.

Sediment - Building 270 Outfall Drainage Swale

Analytical results of the two discrete samples collected from a depositional sand bar within the Building 270 outfall drainage swale indicated the presence of mercury. The concentrations

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 7

reported by the laboratory for the samples identified as 270DS-1A and -1B were 0.49 ppm and 0.29 ppm, respectively. The blind duplicate sample corresponding to 270DS-1A, identified as 270DS-1C, also yielded a result of 0.49 ppm. In addition, TOC results from 270DS-1A and 270DS-1B were 7,620 ppm and 3,630 ppm, respectively. The blind duplicate of 270DS-1A exhibited a TOC concentration of 5,190 ppm.

DISCUSSION OF RESULTS

TRC's mercury investigation served to supplement the USFWS investigation. The results of the USFWS report issued in March 1998 helped, in part, to provide the rationale for sampling within certain areas of Area B and the Building 270 outfall drainage swale to examine potential sources of the mercury contamination. This most recent investigation also focused on two areas not previously investigated as potential source areas or impacted sites: the Air National Guard Built-up area and the drainage swale to the west of Tilton Road.

Area B

Surface soil samples were collected at select locations at Area B (see Figure 1) to determine if any past site activities were responsible for the elevated mercury levels identified in the sediments of the South Branch. Sample locations B-SS1 and -2 were selected due to their close proximity to the most elevated mercury sediments in the South Branch identified during the USFWS studies. Samples B-SS3 and -4 were located in a wooded area approximately 50 feet north of the South Branch. Sample B-SS4 was located in the center of a small topographic depression in the wooded area. Samples B-SS5 and -6 were located downgradient of a concrete pad which past use was of an unknown nature. Samples B-SS7, -8 and -9 were located within a small drainage swale which drains a large portion of the eastern half of Area B.

The results obtained during the TRC investigation clearly supplemented those obtained by the USFWS' previous studies. Two of the sampling locations within the wooded area adjacent to the South Branch in Area B, B-SS3 and B-SS4, indicated positive results for mercury. In particular, the highest concentration (7.8 ppm) was detected in the shallower sample at B-SS3. Positive results were also reported for the shallower soil samples collected at locations B-SS1 and B-SS2, although the concentrations were substantially lower than for the sample at B-SS3. A mercury concentration of 2.2 ppm was reported for the deeper sample at B-SS4. Despite the results for B-SS4, the contamination appears to be more concentrated within the surface soils and diminishes with depth, which corresponds with the South Branch sediment sample findings from the USFWS study. The concentrations of mercury encountered within Area B soils,

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 8

however, do not exceed the New Jersey Residential Direct Contact Soil Cleanup Criteria for mercury set at 14 ppm.

A review of historical aerial photographs of the wooded area in which soil samples B-SS1, -2, -3 and -4 were collected revealed some interesting information. The 1961 photograph from EPA's EPIC study of the Technical Center indicated what appeared to be a small cleared area between sample locations B-SS3 and B-SS4. There did not appear, however, to be any other ground disturbance or human activity in this area. A 1974 aerial photograph of this area appeared to indicate that a majority of the underbrush was cleared from this area, with the larger trees left in place. Again, there was no indication of other ground disturbance or human activity at this time. A 1983 photograph indicated what appeared to be a return of a fairly dense undergrowth in this area, with no other ground disturbance or human activity observed. In summary, it appears that some of the low-growing vegetation in this area was cleared sometime prior to 1961, with more extensive clearing occurring sometime prior to 1974. There was no other obvious (i.e., as seen from the aerial photographs) ground disturbance or human activities associated with this area. As a result of these observations, it is possible that the mercury identified in the soil samples in this area may have been associated with past site activities. However, given the relatively low concentration of mercury identified (0.98 to 7.8 ppm) and the limited scope of this investigation, it is difficult to definitively determine, at this point, whether the soil in this area constitutes a mercury source area.

Another possible explanation to the presence of mercury in the soil samples may originate from flooding events when the South Branch overflows its banks in this area. Mercury contaminated sediments from the South Branch could be deposited in the adjacent floodplain area, resulting in the mercury "hits" exhibited in the soil samples. The scope of this investigation, however, did not focus on this type of scenario and as a result, this theory cannot be substantiated at this point in time.

Surface soil samples collected downgradient of the concrete pad (B-SS5 and B-SS6) did not exhibit mercury above laboratory detection limits. Furthermore, surface soil samples collected from the drainage swale to the west of the concrete pad (B-SS7, -SS8 and -SS9) also did not exhibit mercury. These results indicate that past site activities associated with the concrete pad and the eastern portion of Area B were not responsible for the mercury detected in the soil samples adjacent to the South Branch.

Drainage Swale West of Tilton Road

In order to assess the potential for an existing mercury source in the southwestern region of the

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 9

Technical Center, the drainage swale to the west of Tilton Road was sampled (Figure 2). This swale drains a large area consisting of the Air National Guard flight apron, the southern half of Runway 4-22 and the southern portion of the Air National Guard Alert Area. The sediments in this swale had not been previously sampled.

Although the orientation of the drainage swale is straight (northeast to southwest) and there is some running water in the southern half of the swale (at the time of sampling), there are a number of sediment depositional areas characterized by extensive vegetation (i.e., phragmites). A majority of the sample locations were targeted in these depositional areas. There also was no clear evidence that the drainage swale had been significantly cleared by dredging (no dredge spoil mounds on the banks of the swale) since it was initially excavated sometime in the early 1940's.

Each of the two samples from each of the six evenly spaced sampling locations along the drainage swale yielded non-detects for mercury contamination. These findings have served to diminish the potential for the existence of a source of mercury within this extensive drainage area.

South Branch Dredge Spoils

TRC collected soil samples from a mounded area on the north bank of the South Branch (Figure 2), in response to information provided by FAA. The information suggested that the South Branch may have been dredged annually from the 1960's through the early 1990's. It was suggested that the dredged materials, if impacted by mercury contamination, could be acting as a continuing source of mercury contamination to the South Branch sediments. The soil samples were collected from a relatively high mound on the north side of the South Branch located approximately 225 feet upstream of the confluence of the drainage swale west of Tilton Road and the South Branch. This mound was selected because it was one of the highest mounds along the banks of the South Branch and it was somewhat devoid of vegetation, suggesting relatively recent disturbance.

Mercury was not detected in the samples (0 to 1' and 1 to 2') from this location (SBNB-1). Furthermore, TRC personnel noted several similar mounds on the banks of the South Branch, both upstream and downstream of the position where the dirt service road crosses the South Branch (east of the drainage swale described in the previous section). The tree growth on top of these mounds was quite substantial (i.e., some trees were 8 inches or more in diameter) indicating that the dredging of the mounds in this area was not done annually and had not been done in quite some time. In addition, there was a well-developed soil horizon noted in the one

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 10

location sampled, suggesting minimal disturbance of the soils over time. The TOC results of these samples adds further support to this interpretation, with relatively high concentrations of 13,300 ppm and 25,100 ppm from the 0 to 1 foot and 1 to 2 foot samples, respectively.

In summary, based on the results of this single sample location and assuming these results are representative of other mounds in this area, the dredged spoils on the banks of the South Branch west (upstream) of Tilton Road, do not appear to be impacted by mercury contamination. As a result, these mounds would not be acting as a continuing source of mercury contamination to the sediments of the South Branch. Field observations suggest that any dredging of the South Branch in this area was done at isolated locations and has not been done during at least the last 20 to 30 years. A reconnaissance of the banks of the South Branch downstream of Tilton Road was not performed as part of this investigation, but would be suggested for future mercury studies at the Technical Center.

Air National Guard Built-up Area

In an effort to quantify what may be entering the South Branch through the Building 270 outfall and the associated stormwater drainage system, select catch basins and a depositional area within the outfall's drainage swale were sampled (Figure 3). The results indicated that the sediments within the catch basins are not currently contributing to the concentrations of mercury exhibited within the drainage swale, as all four catch basin samples were reported to be non-detect. There were, however, low concentrations of mercury reported from the sample location within the drainage swale. Again, consistent with previous findings, the shallower of the two samples collected at sample location 270DS-1 exhibited slightly higher mercury concentrations than the deeper sample (0.49 ppm versus 0.29 ppm). Both of these concentrations fall between the low effect level (LEL - 0.2 ppm) and the severe effect level (SEL - 2.0 ppm) for mercury in freshwater sediments as designated by Persaud et al. (1993).

The fact that the USFWS study did not reveal any mercury contamination in the Building 270 outfall and this study did, may be attributed to several different factors, including, but not limited to the following. First, the effects of spatial heterogeneities must be considered when assessing contaminant data that would account for positive results being reported in one area of the swale and not from another. Second, TRC personnel specifically pinpointed a region within the swale that was depositional in nature (i.e., inside bank of drainage swale meander) and would most likely be a source of sediments accumulated over time from upstream positions.

Although the results of the stormwater catch basin sediment did not indicate the presence of mercury, the Air National Guard Built-up area should not be ruled out as a possible source of

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 11

mercury contamination. There have been reports of small mercury spills within Building 33, the water treatment plant, during September and October 1997. Also, there was a recent report of a mercury spill in a building within the Built-up area that was being demolished by the Air National Guard. It is also TRC's understanding that the sediment in the stormwater catch basins is periodically cleaned out as part of regular maintenance of the area. Therefore, current sediment conditions in the catch basins may not be representative of historic sediment conditions. As part of a future mercury investigation at the Technical Center, it is suggested that the frequency of catch basin sediment removal and location of sediment disposal be investigated.

CONCLUSIONS / RECOMMENDATIONS

The results of this investigation have indicated the presence of mercury contamination in the southeast portion of Area B and are suggestive of a potential source area in the vicinity. In addition, the study has ruled out the potential of a source area of contamination existing in the southwestern corner of the Technical Center property that is drained by the drainage swale to the west of Tilton Road. Furthermore, the dredged spoils on the banks of the South Branch upstream of Tilton Road do not appear to be a mercury source.

In light of these findings, future efforts would be best directed toward the South Branch sediments and former meanders in the vicinity and upstream of Area B. Other areas or items that are recommended to be investigated include the location of sediments removed from the Air National Guard Built-up Area catch basins and the nature of dredge spoil mounds on the banks of the South Branch on the downstream side of Tilton Road.

Another area ^{that} is possibly worthy of additional investigation is Winzinger Landfill. Winzinger landfill is located adjacent to FAA's southwestern property boundary approximately 1¼ miles west of Tilton Road. Previous reports have indicated that leachate emanating from the landfill has entered FAA property through a drainage swale. The swale eventually discharged into a wetlands area adjacent to the South Branch. After the NJDEP issued a Notice of Violation to the landfill owners during April 1987, the swale was closed on the landfill side. Prior to the swale being closed, samples of leachate and sediment were collected by FAA, NJDEP and the Atlantic County Department of Health and Institutions (ACDHI). The FAA and NJDEP results did not indicate elevated metals levels. The ACDHI results are not in the FAA files. TRC performed additional sediment sampling of the closed swale (on the FAA side) during February 1994. The sediments were specifically analyzed for mercury with the results indicating a low concentration of mercury (0.13 ppm) in one of the two samples. It was also reported that several monitoring wells are located on the landfill property; however, FAA does not have any

TRC Environmental Corporation

Mr. Keith Buch, COTR
FAA William J. Hughes Technical Center
May 15, 1998
Page 12

records in their files of ground water results from these wells.

Inclusion of the South Branch as an area of concern under the Superfund program seems to be warranted. Immediate future work would include the performance of a Preliminary Assessment / Site Investigation (PA/SI). }

Should you have any questions or comments regarding this submittal, please do not hesitate to call.

Very truly yours,

TRC ENVIRONMENTAL CORPORATION

Robert C. Smith / LJB

Robert C. Smith, P.E.
Program Manager

w/encl.

cc: D. Mather, USEPA (2 copies)
I. Curtis, NJDEP (1 copy)
S. Clancy, Atlantic County (1 copy)
T. DeJesus, Pinelands (1 copy)
M. Revaitis, ACMUA (1 copy)

TABLE 1

SOIL AND SEDIMENT MERCURY SAMPLE SUMMARY
FAA WILLIAM J. HUGHES TECHNICAL CENTER
MERCURY INVESTIGATION
April 1 - 2, 1998

NJ PLANE COORDINATES ⁽³⁾							
SAMPLE NUMBER	SAMPLE DATE	NORTH	EAST	MATRIX	SAMPLE DEPTH ⁽¹⁾	ANALYSIS ⁽²⁾	NOTES
Area B - North Side of South Branch							
B-SS1A	04/01/98	470684	220991	SOIL	0 - 12"	MERCURY, TOC	
B-SS1B	04/01/98	470684	220991	SOIL	12 - 24"	MERCURY, TOC	
B-SS2A	04/01/98	470611	220990	SOIL	0 - 12"	MERCURY, TOC	
B-SS2B	04/01/98	470611	220990	SOIL	12 - 24"	MERCURY, TOC	
B-SS3A	04/01/98	470600	221027	SOIL	0 - 12"	MERCURY, TOC	
B-SS3B	04/01/98	470600	221027	SOIL	12 - 24"	MERCURY, TOC	
B-SS4A	04/01/98	470660	221027	SOIL	0 - 10"	MERCURY, TOC	
B-SS4B	04/01/98	470660	221027	SOIL	10 - 24"	MERCURY, TOC	
B-SS5A	04/01/98	470614	221091	SOIL	0 - 12"	MERCURY, TOC	
B-SS5B	04/01/98	470614	221091	SOIL	12 - 24"	MERCURY, TOC	
B-SS6A	04/01/98	470549	221078	SOIL	0 - 12"	MERCURY, TOC	
B-SS6B	04/01/98	470549	221078	SOIL	12 - 24"	MERCURY, TOC	
B-SS7A	04/01/98	470505	221055	SOIL	0 - 12"	MERCURY, TOC	
B-SS7B	04/01/98	470505	221055	SOIL	12 - 24"	MERCURY, TOC	
B-SS8A	04/01/98	470509	221107	SOIL	0 - 12"	MERCURY, TOC	
B-SS8B	04/01/98	470509	221107	SOIL	12 - 24"	MERCURY, TOC	
B-SS9A	04/01/98	470531	221156	SOIL	0 - 12"	MERCURY, TOC	
B-SS9B	04/01/98	470531	221156	SOIL	12 - 24"	MERCURY, TOC	
B-SS10B	04/01/98	470660	221027	SOIL	10 - 24"	MERCURY, TOC	Duplicate sample of B-SS4B
Drainage Swale West of Tilton Road							
DSWTR-1A	04/02/98	466420	221883	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-1B	04/02/98	466420	221883	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-2A	04/02/98	466574	222134	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-2B	04/02/98	466574	222134	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-3A	04/02/98	466733	222407	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-3B	04/02/98	466733	222407	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-4A	04/02/98	466871	222651	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-4B	04/02/98	466871	222651	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-5A	04/02/98	467030	222914	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-5B	04/02/98	467030	222914	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-6A	04/02/98	467176	223175	SEDIMENT	0 - 12"	MERCURY, TOC	
DSWTR-6B	04/02/98	467176	223175	SEDIMENT	12 - 24"	MERCURY, TOC	
DSWTR-7A	04/02/98	466733	222407	SEDIMENT	0 - 12"	MERCURY, TOC	Duplicate sample of DSWTR-3A
Dredged Spoils from North Bank of South Branch							
SBNB-1A	04/02/98	466159	221852	SOIL	0 - 12"	MERCURY, TOC	MS/MSD
SBNB-1B	04/02/98	466159	221852	SOIL	12 - 24"	MERCURY, TOC	
Air National Guard Built-up Area Stormwater Catch Basins							
CB-1	04/01/98	469150	222034	SEDIMENT	See Report	MERCURY, TOC	Collected from SW pipe @ manhole A-2
CB-2	04/01/98	469219	222802	SEDIMENT	See Report	MERCURY, TOC	Collected from CB southwest of Building 33
CB-3	04/01/98	469388	223233	SEDIMENT	See Report	MERCURY, TOC	Collected from CB @ Wright and Earhart
CB-4	04/02/98	469105	223146	SEDIMENT	See Report	MERCURY, TOC	Collected from CB @ DeSeversky and Earhart
Building 270 Drainage Swale							
270DS-1A	04/02/98	469175	221103	SEDIMENT	0 - 12"	MERCURY, TOC	Duplicate of 270DS-1A; MS/MSD
270DS-1B	04/02/98	469175	221103	SEDIMENT	12 - 24"	MERCURY, TOC	
270DS-1C	04/02/98	469175	221103	SEDIMENT	0 - 12"	MERCURY, TOC	
QA/QC BLANKS							
FB-040198	04/01/98	--	--	WATER	--	MERCURY, TOC	FIELD BLANK
FB-040298	04/02/98	--	--	WATER	--	MERCURY	FIELD BLANK

FOOTNOTES:

(1) SAMPLE DEPTH: Soil and Sediment Sample Depth Measured From Ground Surface

(2) ANALYSIS: MERCURY: CLP / ILM03.0 by cold vapor atomic adsorption, TOTAL ORGANIC CARBON: SW846 EPA Method 9060

(3) NJ PLANE COORDINATES: Horizontal Datum NJ State Plane Coordinates NAD 83

TABLE 2
SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
FAA WILLIAM J. HUGHES TECHNICAL CENTER
MERCURY INVESTIGATION
April 1 - 2, 1998

Area B - North Side of South Branch

SAMPLE IDENTIFICATION:	B-SS1A (0 - 1')	B-SS1B (1 - 2')	B-SS2A (0 - 1')	B-SS2B (1 - 2')	B-SS3A (0 - 1')	B-SS3B (1 - 2')	B-SS4A (0 - 1')	B-SS4B (1 - 2')	B-SS10A (Dup. of B-SS4B)	B-SS5A (0 - 1')	B-SS5B (1 - 2')
SOIL											
Mercury (mg/kg or ppm)	0.06 B	<0.05	0.18	<0.05	7.8	0.98	1.2	2.2	2.6	<0.06	<0.05
Total Organic Carbon (mg/kg)	11000	11500	2720	3530	11600	8230	20800	70800	15700	15900	1050

SAMPLE IDENTIFICATION:	B-SS6A (0 - 1')	B-SS6B (1 - 2')	B-SS7A (0 - 1')	B-SS7B (1 - 2')	B-SS8A (0 - 1')	B-SS8B (1 - 2')	B-SS9A (0 - 1')	B-SS9B (1 - 2')	FB-040198 Field Blank	NJ DEP Direct Contact Soil Cleanup Criteria Residential Non-Resid. (ppm) (ppm)	
SOIL											
Mercury (mg/kg or ppm)	<0.06	<0.05	<0.05	<0.06	<0.06	<0.05	<0.06	<0.05	<0.1 ug/L	14	270
Total Organic Carbon (mg/kg)	1240	711	3400	664	3270	660	3800	653	<0.5 mg/L	-	-

NOTES: <[#] - Indicates the analyte was below the minimum detection limit [#] for the sample
B - Indicates that the analyte was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL).

TABLE 2 (Continued)

SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
FAA WILLIAM J. HUGHES TECHNICAL CENTER
MERCURY INVESTIGATION
April 1 - 2, 1998

Drainage Swale West of Tilton Road

SAMPLE IDENTIFICATION:	DSWTR-1A (0 - 1')	DSWTR-1B (1 - 2')	DSWTR-2A (0 - 1')	DSWTR-2B (1 - 2')	DSWTR-3A (0 - 1')	DSWTR-7A (Dup. of DSWTR-3A)	DSWTR-3B (1 - 2')	DSWTR-4A (0 - 1')	DSWTR-4B (1 - 2')
SEDIMENT									
Mercury (mg/kg or ppm)	<0.05	<0.06	<0.07	<0.07	<0.06	<0.06	<0.06	<0.05	<0.06
Total Organic Carbon (mg/kg)	601	126	4470	512	1600	2870	1650	4830	903

SAMPLE IDENTIFICATION:	DSWTR-5A (0 - 1')	DSWTR-5B (1 - 2')	DSWTR-6A (0 - 1')	DSWTR-6B (1 - 2')	FB-040298 Field Blank	Effect Levels Freshwater (ppm)		Effects Range Marine and Estuarine (ppm)	
						Low	Severe	Low	Medium
SEDIMENT									
Mercury (mg/kg or ppm)	<0.06	<0.07	<0.07	<0.06	<0.1 ug/L	0.2	2	0.15	1.3
Total Organic Carbon (mg/kg)	1170	2240	7630	555	NA	-	-	-	-

Dredged Spoils from North Bank of South Branch

SAMPLE IDENTIFICATION:	SBNB-1A (0 - 1')	SBNB-1B (1 - 2')	NJ DEP Direct Contact Soil Cleanup Criteria	
			Residential (ppm)	Non-Resid. (ppm)
SOIL				
Mercury (mg/kg or ppm)	<0.05	<0.06	14	270
Total Organic Carbon (mg/kg)	13300	25100	-	-

NOTES: <[#] - Indicates the analyte was below the minimum detection limit [#] for the sample
NA - Not Analyzed
Effect Level Range for freshwater, marine and estuarine (Persaud et al., 1993)

TABLE 2 (Continued)

SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
FAA WILLIAM J. HUGHES TECHNICAL CENTER
MERCURY INVESTIGATION
April 1 - 2, 1998

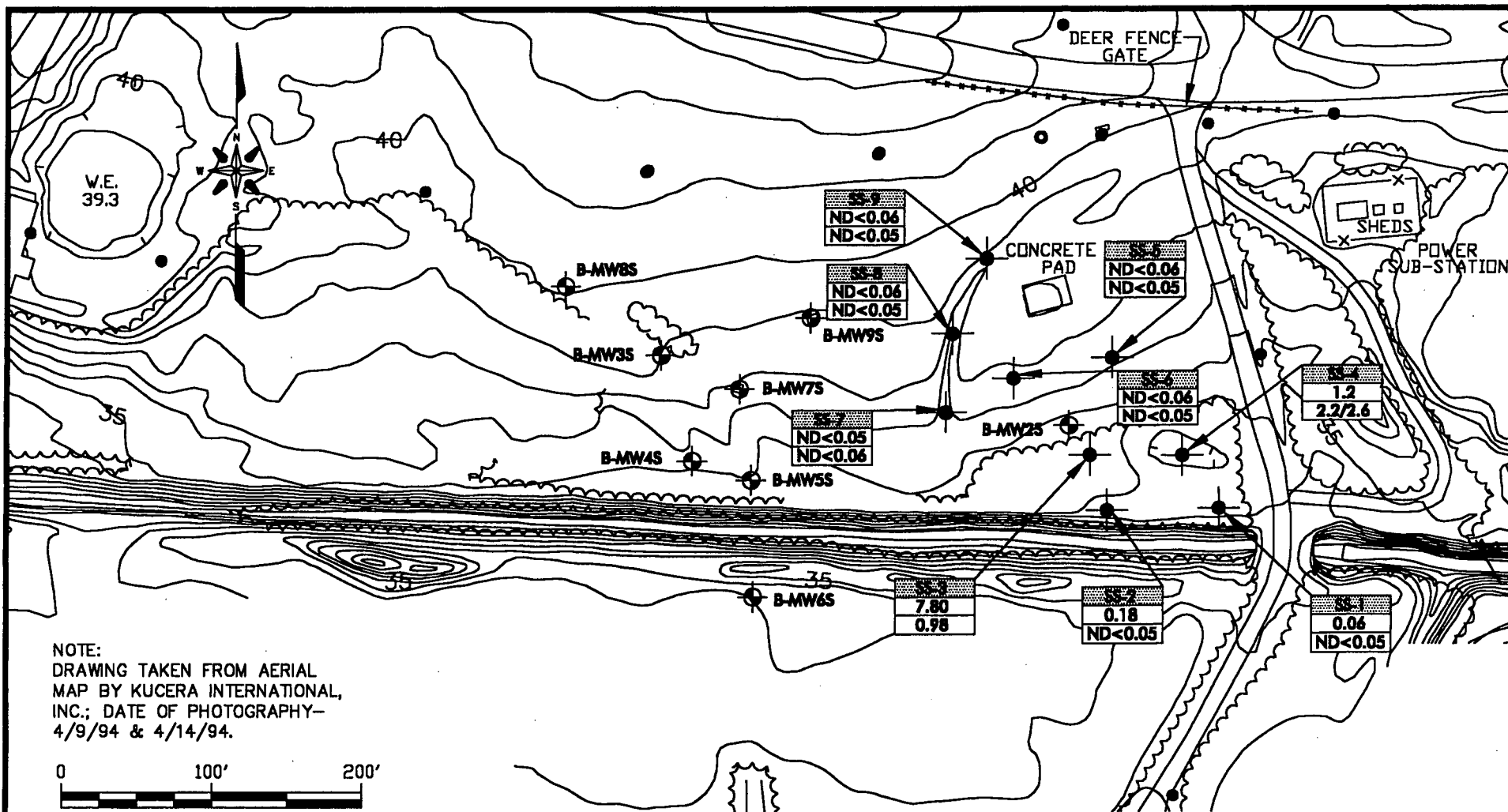
Air National Guard Built-up Area Stormwater Catch Basins

SAMPLE IDENTIFICATION:	CB-1	CB-2	CB-3	CB-4	Effect Levels Freshwater (ppm)		Effects Range Marine and Estuarine (ppm)	
					Low	Severe	Low	Medium
SEDIMENT								
<u>Mercury (mg/kg or ppm)</u>	<0.06	<0.05	<0.06	<0.06	0.2	2	0.15	1.3
<u>Total Organic Carbon (mg/kg)</u>	760	6190	7950	10300	-	-	-	-

Building 270 Outfall Drainage Swale

SAMPLE IDENTIFICATION:	270DS-1A	270DS-1B	270DS-1C (Dup. of 270DS-1A)	Effect Levels Freshwater (ppm)		Effects Range Marine and Estuarine (ppm)	
				Low	Severe	Low	Medium
SEDIMENT							
<u>Mercury (mg/kg or ppm)</u>	0.49	0.29	0.49	0.2	2	0.15	1.3
<u>Total Organic Carbon (mg/kg)</u>	7620	3630	5190	-	-	-	-

NOTES: <[#] - Indicates the analyte was below the minimum detection limit [#] for the sample
Effect Level Range for freshwater, marine and estuarine (Persaud et al., 1993)



NOTE:
DRAWING TAKEN FROM AERIAL
MAP BY KUCERA INTERNATIONAL,
INC.; DATE OF PHOTOGRAPHY-
4/9/94 & 4/14/94.



GRAPHIC SCALE

LEGEND

- B-MW6S MONITORING WELL
- SS-1 SURFACE SOIL SAMPLE
- | |
|------|
| SS-1 |
| 7.80 |
| 0.98 |

 SURFACE SOIL LOCATION
 0-1' INTERVAL (Hg CONCENTRATION)
 1-2' INTERVAL (Hg CONCENTRATION)
- ND<0.05 INDICATES NOT DETECTED OR
BELOW METHOD DETECTION LEVEL

ALL CONCENTRATIONS ARE IN mg/kg (ppm)

**TRC Environmental
Corporation**

5 Waterside Crossing
Windsor, CT 06095
(860) 289-8631

FAA TECHNICAL CENTER
ENVIRONMENTAL INVESTIGATIVE/FEASIBILITY STUDY

FIGURE 1 MERCURY INVESTIGATION AREA B SURFACE SOIL

Date: 04/98

Project No. 01040-0020-00134

\\01040\\0020\\FIG-1

